REMARKS

Claims 1-10 and 12-27 are in the case and presented for consideration.

The Examiner rejected claims 1, 2, 5, 6, 9, 10, 12-15, 18, 21-24, 26 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Sisalem, et al. in view of U.S. Pat. 5,359,593 to Derby, et al. The Examiner stated that "one of ordinary skill in the art would have added Derby's dynamic bandwidth estimation methods in order to enhance QoS control methods (Sisalem; abstract)." See page 5, paragraph 12, of the February 15, 2006 office action.

In response, Applicants respectfully traverse the Examiner's above ground of rejection.

According to MPEP § 2142, in order to establish a prima facie case of obviousness, the Examiner has the initial burden of showing that there is suggestion or motivation in the reference for modifying or combining the teachings of the reference. It is improper to apply a "obvious to try" test to establish obviousness under § 103. Modification of a reference which would render the reference unsatisfactory for its intended purpose or change the principal operation of the reference is not permitted. Also, a reasonable expectation of success of the proposed combination or modification is required. In addition, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicants respectfully maintain that the Examiner's proposed modification or combination would render the resulting "QoS control method" ineffective. Derby, et al. use an estimation and adaption module to monitor changes in incoming network traffic. See Derby, et al., col. 6, lines 20-24.The module uses filters that filter out transient changes in the mean bit rate and red markings probability. The filtered mean bit rate and the filtered

red marking probability are then compared with the established adaptation region for adapting the bandwidth of a packet network connection in response to changes, e.g., in the mean bit rate. See Derby, et al., col. 6, lines 58-64, and col. 11, lines 28-32. If the filtered parameters fall outside of the adaptation region, a new effective burst length is computed and used to request a new bandwidth allocation for the user. See Derby, et al., col. 6, lines 34-41 and 64-68. In contrast, Sisalem, et al. describe a sender based adaption scheme. Losses at the receiver and round trip time are sent back to the sender using Real Time Transport Protocol (RTP), which is also used to estimate the bottleneck bandwidth of a connection. Based on this information, the sender increases or decreases its transmission rate as appropriate. See Sisalem, et al., Section 3, first paragraph.

Accordingly, if the scheme as taught by Derby, et al. and Sisalem, et al. were to be implemented together in an, e.g., end-to-end connection, circumstances could arise where the two schemes would be in competition with one another, leading to overcompensation and or underutilization of available network bandwidth. For instance, the estimation and adaption module at the user's (or receiving) end could detect a significant change in the incoming traffic characteristics that fall outside of the established adaptation region, i.e., a bottleneck, and request an increase in bandwidth allocation. At the same time, the sender will also detect a similar change in the network condition and decrease its transmission rate accordingly. When additional bandwidth is made available to the user, a decease from the pre-adjusted transmission rate by the sender results in underutilization of available network resources and possibly downgrade the quality of service in the packet transmission. With more bandwidth, the sender may detect no packet losses at the adjusted transmission rate and begin to increase transmission rate. See Sisalem, et al., page 5, first paragraph. The increase in bandwidth could potentially elevate the

transmission rate above the pre-adjusted level shortly after the sender experiences a network bottleneck, thereby depriving other connections of network resources. This is contrary to the teaching of Sisalem, et al. (see abstract). In addition, these types of fluctuations in bandwidth are undesirable because significant changes could require new path selection, and frequent changes could lead to a network thrashing condition. See Berthaud, et al., col. 9, lines 29-34. Furthermore, the Examiner has not provided any details regarding how the method taught by Derby, et al. can be implemented in the LDA algorithm of Sisalem, et al. to obtain value(s) of bottleneck bandwidth that are "statistically reliable", as claimed by the Examiner (see page 5, paragraph 12, of February 15, 2006 office action). Therefore, for the reasons discussed above, Sisalem, et al. and Derby, et al. cannot be combined or modified as proposed by the Examiner.

Even if the proposed combination or modification was possible, Sisalem, et al. and Derby, et al., alone or in combination, cannot render Applicants' claimed invention obvious. To estimate the average bandwidth, Sisalem et al. group similar estimates into intervals, and choose the "average of the interval with the highest number of estimates." See Sisalem, et al., page 6, paragraph 3. Contrary to the Examiner's interpretation (see page 6, paragraph 17, of the February 15, 2006 office action), in calculating the bottleneck bandwidth, Sisalem, et al. *assume* that probe packets travel in pairs at the bottleneck and that no packets are dropped, hence, the statement by Sisalem, et al. that "packet drops" were not considered. See Sisalem, et al. page 6, paragraphs 1 and 4. By selecting the interval with the highest number of estimates, Sisalem, et al. hope that the estimates distorted by packet drop will not be statistically significant as to affect the estimated bandwidth (i.e., average interval with the highest number of estimates). In contrast, the

claimed invention teaches sending a plurality of bursts comprising at least 3 packets, and rejecting any burst having a missing packet from the sample. This and other inventive features are also not taught by Derby, et al. Accordingly, Sisalem, et al. and Derby, et al. cannot render Applicants' claimed invention obvious.

The Examiner further rejected claims 3 4, 7, 8, 16, 17, 19, 20 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Sisalem, et al. and Derby, et al. and further in view of U.S. Pat. 5,815,492 to Berthaud, et al.

In response, Applicants respectfully traverse the Examiner's above ground of rejection. Applicants respectfully maintain that for the reasons discussed above Sisalem, et al. and Derby, et al. cannot disclose, teach or suggest Applicants' claimed invention. In addition, Berthaud, et al. do not explicitly or implicitly teach filtering packet samples that encounter OS delay. Examiner stated that Berthaud, et al. teach filtering samples that are not statistically reliable. See page 7, paragraph 23, of the February 15, 2006 office action. Then by inference, Examiner concludes that Berthaud, et al. disclose filtering packet samples that encounter OS delay because based on the Examiner's knowledge all packet samples encountering OS delay are statistically unreliable. See page 7, paragraph 23, of the February 15, 2006 office action (stating that "given that packet samples encountering OS delay are statistically unreliable and are therefore filtered from the estimation for that reason). Applicants respectfully traverse the Examiner's above assertion, and request that an affidavit under 37 C.F.R. § 1.104(d)(2) be provided to show that packet samples having encountered OS delay cannot be used for estimating bandwidth because they are all *statistically unreliable*.

Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested. No new matter has been added.

Respectfully submitted,

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